February 24, 1960

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To: Interested Agencies

Subj: Technical Proposal - Development and Construction of Stereocomparator [redacted]

[redacted] proposes to develop and construct a new series of photogrammetric stereocomparators with special characteristics. These planned characteristics will permit high speed, high accuracy digital analysis of stereoscopic and monoscopic photographic presentations with maximum performance reliability and will represent a new technical approach to comparator design.

The proposed instrument, as is common with all comparator designs, will have the following basic components:

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A. Main supporting frame;

B. Staging system;

C. Optical observation system;

D. Measuring and Coordinate readout system.

A. The main supporting frame will be a console-type self-supporting design. It will support the entire instrument independently of any auxiliary deck or table. It will be rugged and stable enough to keep the precision alignment essential for the mechanical and optical components.

B. The staging system will accept film transparencies or glass plates with a maximum format of 10" x 20" (9" x 18" to be measured). A swing or kappa motion of 9° will be provided for each stage. The instrument will be equipped with two stages. The photographic material will be securely affixed to the moving carriage and will be kept flat by transparent pressure plates. Inasmuch as all viewing will be directly orthographic, no error will be contributed by use of pressure plates. Transport of the stage to accomplish viewing of the entire stereoscopic area will be both in the X and Y directions under a fixed binocular observational train. Drive will be accomplished by lead screws controlled by servo motors. High speed slewing, as well as micrometric slow movement, will be

available to the operator. Control will be activated by push buttons for high speed and handwheels for slow motions. Provision will be made to transport both stages either independently of each other or both simultaneously in synchronism.

C. Optics will be first-class high resolution coated elements. It is proposed to furnish four discrete magnifications of 8, 10, 18 and, by substituting eyepieces, 2, 2.5, 4.5, or else 8, 12, 18 and, by substituting eyepieces, 2, 3, 4.5. An illuminated dot floating mark will be provided with a choice of color and variable intensity. The background illumination for viewing the transparency will also have a variable intensity. Particular attention will be paid to designing the optical train for maximum resolution and large field. Provision will be made for optical switching so that either stage can be viewed by either eye of the operator. Prisms will be integrated in the optical train to allow the operator to rotate the observed image 90° so that parallaxes can be viewed either as a function of Y or X.

D. The measuring and coordinate readout system will be independent of the transport media. Actual measurements will not rely upon the precision and accuracy of a lead screw but will be accomplished by photoelectric fringe counting technique [redacted]. This method will permit extremely high slew speeds coupled with an optimum accuracy of the order of 2 microns (0.002 mm). Coordinate data will be available visually on illuminated panels and typewritten tabulation. The illuminated panels will show six digits. The data will also be recorded either on five-channel or eight-channel tape, per the client's request. This data can also be recorded on [redacted] cards if so desired. A memory capability can be provided and is optional with the client. This memory capability will permit the operator to initiate the recording of the coordinates of a point and continue the operation of the comparator without the necessity for waiting for the completion of the recording of the point desired. This effectively somewhat increases the speed of operation.

It is specifically the desire [redacted] to provide its clients with a stereocomparator which most nearly meets the special needs of its clients. It is recognized that various services have certain special requirements and also that instruments designated for military use are somewhat different and specialized from those instruments designed for non-military usage. This particular proposal is intended to provide a military type instrument. The proposal is deliberately general for it is recognized that it will be highly desirable to review with the potential client certain details which can be added or deleted from the design without materially changing the cost or effort required to produce the instrument. The proposal specifically puts forth the major characteristics.

[redacted] proposes to deliver three stereocomparators conforming to the above general characteristics within fifteen months from date or receipt of order at a unit cost [redacted] per instrument.

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STATINTL [redacted] proposes to furnish five such instruments at a rate of one per month commencing fifteen months after receipt of order at
STATINTL a unit cost of [redacted] per instrument.

STATINTL The [redacted] proposes to furnish ten such instruments at a rate of one per month commencing fifteen months after date of receipt of
STATINTL order at a unit price of [redacted] per instrument.

Enclosed herewith are general schematic diagrams of the proposed design. These sketches are merely intended to convey the design concept and are not necessarily binding upon the final design of the instrument.

[redacted]

President

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